BREEDING SUCCESS OF EDIBLE-NEST SWIFTLETS IN A MAN-MADE NESTING HABITAT

(Keberhasilan Berbiak pada Walet Sarang Putih Dalam Habitat Buatan)

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ABSTRAK

Tujuan penelitian ini adalah mengungkapkan keberhasilan berbiak pada burung Walet Sarang Putih *Collocalia fuciphaga* yang berbiak dalam suatu habitat buatan (rumah walet) di Semarang. Pengamatan terhadap suatu koloni walet dilakukan selama November 1995 hingga Januari 1996. Data yang dikumpulkan adalah saat peneluran, saat penetasan serta monitoring individu anakan yang mati. Masa pengeraman rata-rata adalah 23.6 hari. Dari 199 sarang yang diteliti (228 telur), 30 butir telur (13.16%)tidak berhasil menetas. Jadi, keberhasilan penetasan adalah 86.84%. Dari 198 telur yang menetas, 189 anakan (95.45%)dapat dipelihara oleh induknya hingga dewasa dan mampu meninggalkan sarang sekitar usia 40 hari. Tingginya tingkat keberhasilan berbiak (82.89% dari telur yang ditetaskan) merupakan indikasi bahwa kemampuan hidup induk tinggi, induk mampu memelihara anakan, makanan cukup melimpah, kondisi iklim mikro cukup memadai, bentuk dan kondisi sarang cukup baik, dan tidak ada kematian karena predator.

Keywords: Swiftlet, breeding, Java, swiftlet houses, *Collocalia*

INTRODUCTION

The Edible-nest Swiftlet (*Collocalia fuciphaga*) has been receiving more attention lately due to the fact that this bird produce an edible nests which fetch a high value in the international market. The original nesting habitat of this species is limestone caves. Since approximately a hundred year ago, people of Java has been successfully farmed the swiftlets in houses which managed in such a way to resemble natural cave habitat (Mardiastuti, 1996).

There has been no previous study on the breeding ecology of the Edible-nest Swiftlet in Indonesia, either in natural cave habitats or in man-made nesting habitat. This paper aims to reveal the breeding success of the species and investigate the possible causes of the breeding failure in swiftlet houses.

METHODS

The study was conducted in a swiftlet house in Semarang (Central Java, Indonesia) from November 1995 to January 1996. The swiftlet house is a big seven-storied building and inhabited by a mix colony of Edible-nest Swiftlets and Linchi Swiftlets C. *linchi*. Among the rooms present in the house, only one room with the highest number of Edible-nest Swiftlets was used. Approximately 85% of the available nests were sampled for this study. The rest of the nests were not used due to the difficulties in reaching the nests.

A total of 119 nests were chosen as samples. The breeding stage at the initial study varied from empty nests (n = 46), contained 1 egg (n = 19), contained 2 eggs (n = 53), and contained 1 egg + 1 hatchling (n = 1). Of these, 228 eggs from 114 nests were available for investigation.

Headlamps were used to lit the room during investigation since the room was completely dark. Data collection was conducted in the morning (9 am to 10 am), while most of the parents went out for feeding. Nests and eggs were marked individually. Eggs and hatchlings were checked every other days. Missing eggs, missing hatchlings, and dead hatchlings were recorded. Some additional data were also gathered, i.e., micro-climate (temperature and relative humidity), and incubation period. In addition, eggs were also weighed by using an Ohaus scale to the nearest 0.01 g. When the eggs or nestlings were missing, the floor beneath was investigated to search for egg debris or carcasses. Hatching success, fledging success, and the overall breeding success were calculated by taking percentage.

RESULTS

Of the 228 eggs being investigated, 30 eggs (13.16%) were not able to hatch, while 198 eggs survived the incubation period and successfully hatched. The hatching success was, therefore, 86.84%. Of the 30 eggs that did not hatch, 26 eggs (87%) were disappeared from the nests and 4 eggs (13%) were accidentally cracked during measurement and failed to hatch.

On the average, the incubation period took 23.6 days (n=77). Of the 198 eggs hatched, 189 nestlings were successfully raised by their parents and fledge on the 40th day (chicks fledged was 95.45%), whereas 9 chicks (4.54%) could not survive the nestling period. Of these, 4 chicks were found dead beneath their nests, and 5 others dissapeared without any trace of carcasses beneath the nests. The overall breeding success from egg laid to fledging stage (percent egg fledged) was 82.89%. There is no indication that the second clutch had a lower breeding success than the first.

DISCUSSION

Hatching Success

The hatching success for the house swiftlets (86.84%) in this study was higher than house swiftlet in Penang - Malaysia which only had an average hatching success of 79.4% (Langham, 1980). The eggs of the Edible-nest Swiftlets in Penang were lighter (1.2 g, n = 15) than in this study (1.97g, n=58). This is probably due to the geographical variances between Java (race *fuciphaga*) and Penang (race *amechana*) (Mardiastuti and Mranata, 1996).

Earlier studies on other species, e.g., Boat-tailed Grackle *Quiscalus major* (Brancroft, 1984) has proven that weight of eggs did not influence the hatching success. There has been no information on the effect of size on the hatching success for swifts or swiftlets elsewhere. Therefore, a firm conclusion cannot be drawn at this stage.

Egg debris on the floor of a swiftlet house sometimes were difficult to discover in the next visit, suggested that scavanging by the insects (especially ants) and/or decomposition processes by microorganisms on the floor were very rapid.

Factors influenced the hatching success could not be determined precisely. It is speculated that missing eggs can be due to falling down accidentally when parents make sudden flight, or eaten by predators, e.g., geckos, rats. Some eggs also unable to hatch because the egg shells were cracked. The approximate thickness of the eggshell was 0.050 mm. It is possible that some eggs have thinner eggshells due to unknown reason (pesticide contamination), making the eggs easily breaks off.

Analyzing hatching success of several open-and hole-nesting birds, Welty (1982) found out that percent hatching success for various bird species varies between 54.6% for Mourning Dove *Zenaida macroura* and 83.4% for Tree Swallow *Iridoprocne bicolor*. Hatching success of the Edible-nest Swiftlet (86.84%), therefore, considered to be high.

Fledging Success

The high fledging success (95.45% of the hatchlings) could be an indication of several factors. First, mortality of both parents was low. Chicks of the Edible-nest Swiftlets are completely dependent to their parents before they fledge. It is speculated that both parents are needed to feed the two chicks. If the chicks survive, it can be inferred that both parents are available to feed their chicks.

Second, parents were experienced in taking care of their chicks. They were probably having enough experiences from the previous breeding season(s). Third, insects food were abundant. The study was conducted during mid rainy season, which coincide with the abundance of the insect food. Fourth, the micro-climate inside the house was optimum. Micro-climatic observation showed that the daily temperature of the room was 26-28°C, and the relative humidity was between 85-98%.

Fifth, the shapes of nests were suitable for nestlings. Survival of the young also depends on the shape and quality of the nests. The nestling will be easily fall down if the bowl is shallow. Further, a soft bowl (due to an extremely high humidity) could also easily make the nestling fall down, especially when they start to cling to the edge of the nests. Sixth, pedators were lacking. Predators that may prey on chicks are rats and geckos. Blood-sucking mites are also known to cause death, especially to the newly born chicks.

Breeding Success

Breeding success from eggs to fledge in this study was quite high (82.89%), with most of the failure occured during incubation period. This brings the additional population of approximately 94 pairs of birds. However, this work still cannot predict how many of the fledglings could survive until reach maturity and how many of them shall return to their hatching place. Breeding success of Edible-nest Swiftlet studied by Langham (1980) was only 48.4%. Based on data on breeding success collected by Welty (1982), the highest percent eggs fledge was reached hole nesting birds, namely House Wren *Troglodytes aedon* (79.0%), followed by Starling *Sturnus vulgaris* (75.1%).

Management Implication

The Edible-nest Swiftlets in Java is known to capable to breed all year long, although there is some indication that rainy seasons are preferred to breed. Harvesting of nests can be done three to five times a year. With the high breeding success proven in this study, population of the Edible-nest Swiftlet can be increased with only a single breeding attemps. Further research is still needed, especially that related to the survival of fledglings and rate of return of the successfully fledged young birds.

Until now, most owners of swiftlet houses belive that human visits into the swiftlet houses could disturb the colony and might drive away the birds. This research has proven that continuous but careful investigation on the colony will not disturb the birds or reduce the survival rate of the chicks.

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